

## Managing risks to town drinking water quality after bushfires

*Rainfall after bushfires is likely to increase contaminants in runoff which could present challenges to the treatment of drinking water. Councils in bushfire-affected areas should be prepared to increase water quality monitoring and optimise treatment processes to ensure they manage drinking water according to the Australian Drinking Water Guidelines.*

*Post-fire actions to protect water quality include rehabilitating bushfire control lines and access tracks as well as undertaking work to control erosion.*

## Potential effects on water quality after bushfires

Heavy rain after a fire can significantly affect water quality. Immediate effects include very large increases in the levels of pathogens, sediments and pollutants in raw water. These can pose major challenges to maintaining effective water treatment processes.

Loss of vegetation coupled with changes in soil structure make fire-affected soils erode more easily. Combustion of organic matter, soil heating and the production of ash and charcoal contribute to the release of numerous nutrients, metals and toxins that are usually unavailable for transport into waterways. Fires also result in a build-up of loose sediment and ash that can be washed into streams during rain. After heavy rain, this can result in a sediment 'slug' that can scour and smother instream habitats and reduce dissolved oxygen levels. Sediment loads in waterways can be elevated for several years following bushfires.

Greater amounts of sediments entering the waterways also increase the concentrations of nutrients in the system. Fire retardants entering waterways have low toxicity but may cause an increase in nutrients.

The increased nutrient load and decreases in dissolved oxygen can pose other water quality risks, including cyanobacteria blooms, fish deaths and damage to stream ecosystem health.

The challenges that these changes to water quality present for water treatment are:

- **increased solids**—pose significant risk to maintaining effective water treatment and production
- **increased nutrients**—promote cyanobacterial growth and algal blooms potential risk
- **increased metals and major ions**—create taste and odour issues, corrosion of pipes
- **increased potential for contaminants**, which may require additional treatment facilities/processes to remove
- **increased dissolved organic carbon** requires increased chlorination, which may result in increased chlorination by-products.

Councils must discuss any questions about drinking water safety with the local Public Health Unit. The public must receive an alert to boil water or other warning where unsafe water is being supplied. The greatest risks to consumers of drinking water are pathogenic microorganisms.

## Actions councils should take

Councils in bushfire-affected areas should inspect catchments affected by bushfires as soon as conditions are safe. Councils may need to increase water quality monitoring and optimise treatment processes to ensure drinking water continues to meet the Australian Drinking Water Guidelines.

### Preparation and planning

Councils should be prepared to respond to incidents as they arise.

Councils should review the following issues and if required contact the relevant regional manager for the Department of Planning, Industry and Environment—Water to discuss contingency planning.

- Consider rostering and leave arrangements for key staff.
- Review communication and response plans and check contact details are correct.
- Ensure adequate supply of key water treatment chemicals.
- Review NSW Health response protocols for managing drinking water risks.

### Raw water extraction

Raw water quality is likely to be at its poorest at the start of heavy rainfall, as most contaminants are mobilised by this 'first flush' of water. Where feasible, 'first flush' water should be prevented from entering raw water storages.

Councils should be alert to any change in contaminant levels that their current water treatment process may have difficulties in treating. Regular operational monitoring of raw water can detect changes in water quality and ensure appropriate chemical dosing and treatment options occur.

Councils should be aware that turbid water could mask bacteria and other pathogens. Turbid water can also reduce the effectiveness of disinfection processes.

Councils should undertake following steps:

- Monitor weather forecasts for impending rain in affected catchments.
- Consider how ash, debris and eroded soil can be prevented from entering storages, including use of silt booms and curtains.
- Before heavy rain, fill water storages and consider turning off river pumps to allow the first, most contaminated water, to flow past.
- If storages allow, avoid extracting water until water quality improves.
- Investigate options that would allow water treatment plants to operate at reduced flow rates to better manage anticipated high-solid loads.
- Conduct more frequent and comprehensive testing of raw water to identify any contaminants that may require additional treatment facilities/processes.
- Increase the frequency of operational testing of raw water and water at different process stages to maintain optimal treatment.
- Carry out frequent jar testing to optimise treatment processes as source water quality changes.
- Consider the use of powdered activated carbon to assist in treating taste, odour and other contaminants not effectively removed by aluminium and iron flocculants.

### Operational process monitoring

Monitoring treatment processes is vital to ensuring the safety of drinking water for consumers.

Councils should undertake the following steps:

- Conduct regular inspections to ensure all treatment equipment and processes are performing satisfactorily.
- Be aware of the critical control points for each system and ensure that these are monitored regularly.
- Where online monitoring is not available, increase the frequency of operational testing to ensure changes are detected and responded to quickly. Key operational parameters include coagulation pH, pre- and post-filter turbidity, and chlorine residual leaving clear water tanks.
- Apply guidance from council drinking water management systems on identifying and responding to risks to maintaining potable water supplies.
- Immediately notify the Public Health Unit in line with NSW Health response protocols if a critical limit is exceeded.
- Contact your local Public Health Unit (1300 066 055) with any questions about the safety of drinking water, including communicating risks with the public.

### Drinking water distribution

Changes in raw water quality may change the taste and smell of drinking water for consumers.

Councils should remain vigilant to customer complaints and investigate all issues.

Public Health Units can advise on water quality testing and, where necessary, arrange free testing for local council supplies.

After bushfires, councils also need to be aware that:

- reservoirs may have been affected by bushfires, including damage to roofs, internal lining, pipework, vermin proofing, and structural integrity
- telemetry and communications equipment may be damaged or unreliable and should be inspected
- any third-party telecommunication or other equipment repairs may damage reservoir or roof integrity and impact water quality

### Contacts for further information

**NSW Public Health Units** can advise on water quality testing and, where necessary, arrange free testing for local council supplies. NSW Health can assist with specialist water quality and engineering contractors to help manage fire effects on drinking water quality. This could include investigation of catchment impacts and treatment optimisation.

Public Health Units: 1300 066 055

**Department of Planning, Industry and Environment—Water** has regionally based staff who can provide technical assistance to councils on water treatment processes. Some councils have limited treatment processes available, for example disinfection-only drinking water supply systems. If necessary, these councils should contact the relevant regional manager for water utilities of the department's Water Division to discuss contingency planning.

# Bushfires and town water quality

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Fact sheet for councils



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